The foregoing description is provided to illustrate the invention, and is not to be construed as a limitation. Numerous additions, substitutions and other changes can be made to the invention without departing from its scope as set forth in the appended claims.

Replace the paragraph beginning at page 20, line 2, with the following paragraph:

I Claim:

After page 22 add a new page 23 to read as follows:

Abstract of the Disclosure

A method for determining at least one time constant of a reference model, which is designed as a 2nd order time-delay element of a machine. The method includes detecting an oscillation frequency of an undamped machine oscillation and determining an optimized value of a time constant of the reference model as a function of the detected oscillation frequency of the undamped machine oscillation.

In the Claims:

Please cancel claims 1-16 without prejudice and add claims 17-35 as follows:

17. A method for determining at least one time constant of a reference model, which is designed as a 2nd order time-delay element of a machine, said method comprising:

detecting an oscillation frequency of an undamped machine oscillation; and

determining an optimized value of a time constant of said reference model as a function of said detected oscillation frequency of said undamped machine oscillation.

18. The method of claim 17, wherein said reference model is arranged in a cascaded control arrangement and is located between a position control device with a loop gain and a closed speed control device, which comprises a proportional branch and an integral branch, and wherein said reference model at least essentially simulates the behavior of said closed speed control circuit without taking said integral portion into consideration.

19. The method of claim 18, comprising:

presetting a starting value of said time constant;

presetting a starting value of a second time constant of said reference model; and

increasing a loop gain of said position control device in steps up to a first maximum loop gain, at which an undamped machine oscillation is registered.

20. The method of claim 19, wherein said starting value of said time constant is preset to zero and said starting value of said second time constant is preset to zero.

21. The method of claim 17, wherein said optimized value is determined in accordance with the equation:

$T2\_OPT = f(f_{S1}) = 1 / (2 * \pi * f_{s1})$, wherein f_{s1} = said oscillation frequency.

22. The method of claim 19, wherein said optimized value is determined in accordance with the equation:

$T2\_OPT = f(f_{S1}) = 1 / (2 * \pi * f_{s1})$, wherein f_{s1} = said oscillation frequency.

23. The method of claim 19, wherein said second time constant is determined from preset system parameters.

24. The method of claim 23, wherein said second time constant is determined in accordance with the equation:

$T1\_OPT = (J_L * 2 * \pi) / (k_p * K_{MC})$

wherein J_L: Momentary load,

k_p: Loop gain of the proportional branch of the speed control device,

K_{MC}: Motor constant.

25. The method of claim 23, further comprising checking whether said previously determined time constant assures a desired control behavior of said position control device.

26. The method of claim 25, wherein said increasing of said loop gain is accomplished by using said optimized time constant, until an undamped machine oscillation is registered, and an associated loop gain is used as a second maximum loop gain during subsequent operation of said method.

27. The method of claim 26, further comprising multiplying said second maximum loop gain by a safety factor K, wherein K < 1.

28. The method of claim 23, further comprising checking whether said second time constant provides an acceptable system behavior, or whether an optimization of said second time constant must be performed.

29. The method of claim 28, further comprising optimizing said second time constant by, proceeding from said starting value for said second time constant, changing said second time constant in steps until said undamped machine oscillation is registered, and a value of said optimized second time constant obtained therefrom is used as an optimized value for parameterizing said reference model.

30. The method of claim 29, further comprising:

using said optimized time constant and said second time constant; and

increasing said loop gain until an undamped machine oscillation is registered, and using an associated loop gain as a second maximum loop gain in subsequent operation of said method.

31. The method of claim 1, wherein said method is exercised in an automated manner.

32. The method of claim 1, further comprising using in said machine said reference model with said optimized value of said time constant.

33. The method of claim 31, wherein said machine theoretically requires

an nth order reference model, wherein n > 2 applies.

34. A device for determining at least one time constant of a reference model, which is designed as a 2nd order time-delay element of a machine, said device comprising:

a reference model arranged in a cascaded control arrangement;

a position control device with a loop gain;

a closed speed control device, which comprises a proportional branch and an integral branch and wherein said reference model is located between said position control device and said closed speed control device;

a detector for detecting an oscillation frequency of an undamped machine oscillation; and

an optimizer that determines an optimized value of a time constant of said reference model as a function of said detected oscillation frequency of said undamped machine oscillation.

35. The device of claim 34, wherein said reference model at least essentially simulates the behavior of said closed speed control circuit without taking said integral portion into consideration.

Please note that new claims 17-35 are being presented to provide additional coverage regarding a measuring system. In addition, since the original claims reflect a literal translation of the claims of the corresponding Patent Cooperation Treaty,

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